

Indoor gas-insulated metal-clad switchgear

TGS-40.5

Technical data

TGOOD
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Operating environmental conditions

Place of installation	Indoor
Ambient temperature	-5 °C ~ +40 °C
Altitude	3000 m
Air humidity	Daily average \geq 95% Monthly average \geq 90% (25 °C)
Type of insulating gas	Sulphur hexafluoride (SF ₆) SF ₆ -free version available

This product needs to be installed in a site that will not expose it to fire hazards, explosions, chemical corrosion or sharp vibrations. TGOOD provides integrated electrical enclosure solutions for this GIS, such as our outdoor ehouses, kiosks and modular substations.

Standard compliance

IEC 62271-200	High-voltage switchgear and control gear-Part 200: AC metal-enclosed switchgear and control gear for rated voltages above 1kV and up to and including 52kV
IEC 62271-100	High-voltage switchgear and control gear-Part 100: High-voltage alternating- current circuit-breakers
IEC 62271-102	High voltage switchgear and controlgear-Part 102: Alternating current disconnectors and earthing switches
IEC 62271-103	High-voltage switchgear and controlgear-Part 103: Switches for rated voltages above 1 kV up to and including 52 kV
IEC 62271-206	High-voltage switchgear and controlgear - Part 206: Voltage presence indicating systems for rated voltages above 1 kV and up to and including 52 kV
IEC 61869-2	Current transformers
IEC 61869-3	Voltage transformers
IEC 60529	Degrees of protection provided by enclosure (IP code)

Electrical parameter of switchgear		
Rated voltage	kV	40.5
Rated frequency	Hz	50
1 min power frequency withstand voltage (RMS) (phase to phase, to earth/across isolating distance)	kV	95/118
Lightning impulse withstand voltage (RMS) (phase to phase, to earth/across isolating distance)	kV	185/215
Rated busbar current	A	630, 1250
Rated short-circuit breaking current	kA	20, 31.5
Rated short-time withstand current/duration	Load switch	20 / 4
	Circuit breaker	31.5/4
Rated peak withstand current	kA	50, 80
Rated short-circuit making current (peak)	kA	50, 80
Protection degree of gas-filled compartment	IP	67
Protection degree of compartments	IP	4X
Circuit resistance	Load switch panel	≤ 150
	Circuit breaker panel	≤ 150
SF ₆ gas rated pressure (gauge pressure at 20°C)	MPa	0.05
SF ₆ gas minimum pressure (gauge pressure at 20°C)	MPa	0.02
SF ₆ gas annual leakage rate		≤ 0.1%
Partial discharge	pC	≤ 20 @1.1Ur
EMC	Class	3, performance A
Radiation	uSv/h	≤ 5 @40.5 kV, ≤ 150 @118 kV
Moisture content	UL/L	≤ 150
Internal arc classification		AFLR, 20 kA, 1s (Load switch panel)
		AFLR, 31.5 kA, 1s (CB panel)
Busbar dimension	mm	TMY-60x6 (630A C/V); TMY-80x8 (1250 A V)
Panel dimension with top box (W x D x H)	mm	500 x 1000 x 2250 (C/V)
Functional panel weight	kg	650/700 (C/V)
Extension		Top (Lateral optional)

Electrical parameter of load switch and circuit breaker

Circuit breaker

Standard compliance		IEC 62271-100
Rated voltage	kV	40.5
1min power frequency withstand voltage (RMS) (phase to phase, to earth/across isolating distance)	kV	95/118
Lightning impulse withstand voltage (RMS) (phase to phase, to earth/across isolating distance)	kV	185/215
Rated current	A	630/1250
Rated frequency	Hz	50
Rated short-circuit breaking current	kA	20, 31.5
Rated short-time withstand current/duration	kA/s	20/4, 31.5/4
Rated peak withstand current	kA	50, 80
Rated short-circuit making current (peak)	kA	50, 80
Rated operation sequence		0-0.3s-CO-180s-CO
Mechanical endurance	Time	20,000
Electrical endurance at 100% I _{sc}	Time	30, E2
Vacuum interrupter		Xiamen Hongfa Electroacoustic Co., Ltd HFTD-40.5/1250-31.5 kA
Mechanism		Spring type
Motor	V/A	DC110/-
Opening/closing coil	V/A	DC110/1.68
Rated cable charging current switching	A	5-20 [CC1], C2 50 [CC2], C2
Out of step making and breaking	kV/kA	58.5/2.36 [OP1] 58.5/7.9 [OP2]
Double earth fault breaking	kA	27.4
DC component		51%
DC time constant	ms	45
First-pole-to-clear factor		1.5
Out-of-phase voltage factor		2.5
Closing time, opening time	ms	32-48; 20-43

Load switch

Standard compliance		IEC 62271-103
Rated voltage	kV	40.5

1min power frequency withstand voltage (RMS) (phase to phase, to earth/across isolating distance)	kV	95/118
Lightning impulse withstand voltage (RMS) (phase to phase, to earth/across isolating distance)	kV	185/215
Rated current	A	630
Rated frequency	Hz	50
Rated short-circuit breaking current	kA	20
Rated short-time withstand current/duration	kA/s	20/4
Rated peak withstand current	kA	50
Rated short-circuit making current (peak)	kA	50 (3 times)
Mechanical endurance	Time	5,000, M2 (Load switch) 3,000 (Earthing switch)
Mechanism		Spring type
Motor	V/A	DC110/-
Opening coil	V/A	DC110/1.68
Rated cable charging current switching	A	4.2-8.4 (CC1) 21 (CC2)
Rated line charging current switching	A	2.1
Closing, opening time	ms	≤ 12000; 30-50
Disconnecter Switch (If Applicable)		
Applicable standard		IEC 62271-102
Rated current	A	630/1250
Rated short-time withstand current	kA	31.5
Peak withstand current		80
Rated duration of short circuit	s	4
Mechanical endurance		3,000
Motorized operation availability		No
Earthing Switch		
Applicable standard		IEC 62271-102
Rated short-time withstand current	kA	20, 31.5
Peak withstand current	kA	50, 80
Rated duration of short-circuit	s	4

Short-circuit making capability	Times	2 (Switch); 5 (CB)
Mechanical endurance	Times	3,000
Motorized operation availability		No

Mechanical parameters of load switch and circuit breaker				
		Load switch	Circuit breaker	Three-position disconnecter
Rated short-time breaking current	kA		20	31.5
Contact pressure	N		2500±300	3100±300
Clearance between opening contacts	mm	87±3	17±1	Isolated moving and fixed contact ≥93; Grounding moving and fixed contact ≥90.
Overtravel	mm	33±3	4±1	
Speed at instant of touching	m/s	2.7±0.2	0.8±0.25	
Speed at instant of opening	m/s	2.5±0.2	1.7±0.25	
Contact closing bouncing time	ms		≤3	
Opening and closing insimultaneity of three pole contact	ms	≤3	≤2	≤3

Electrical parameters of tangible type overvoltage protection (surge arrester)*		
Type		SH-YH5WZ-51/134
System nominal voltage	kV RMS	35
Continuous running voltage	kV RMS	40.8
DC 1mA reference voltage	kV	73
2ms rectangular current discharge capacity		400
Residual voltage of steep impulse current (peak)	kV	154
Residual voltage of lightning impulse current (peak)	kV	134
Residual voltage of operation impulse current (peak)	kV	114
Power frequency reference voltage		51

Electrical parameters of current transformer*

Type	Rated primary current	Rated secondary current	CSR1-40.5					
			Accuracy class and rated secondary output (VA)			Accuracy class and rated secondary output (VA)		
			0.2S	0.2	0.5	10P20	10P15	10P10
High-precision Current transformer	200	5	2.5	7.5	10	2.5	3.75	5
	400		5	12.5	15	5	7.5	12.5
	600		10	20	25	7.5	12.5	12.5
Type	Rated primary current	Rated secondary current	CBC1-40.5					
			Accuracy class and rated secondary output (VA)			Accuracy class and rated secondary output (VA)		
			0.2	0.5	1	10P15	10P10	10P5
Open-type Current transformer	200	5		7.5		2.5	5	
	400		5	12.5		7.5	10	
	600		10	20		10	15	

Electrical parameters of voltage transformer*

Type	VSSIF4-40.5/195L		
Rated voltage ratio	35/√3/0.1/√3/0.1/3		
Accuracy class combination	0.2/3P, 0.5/3P, 1/3P, 3/3P		
Rated secondary output	VA	30/100, 100/100, 150/100, 300/100	
Limit	VA	300	

*Other types or parameters of component may be available. Please consult TGOOD.